

CREATING TOOLS

to support decision making



The aim of the Smart-Pic project is to promote general use of an integrated crop protection approach that takes into consideration several diseases.

Based on complicated principles and the use of numerous tools, integrated crop protection is struggling to get off the ground. An ACTA-led research project has been designed to facilitate its implementation.

« There is a need for new tools, to help farmers make decisions adapted to their respective production objectives during the cropping season. »

Regulation changes, the advent of new disease-control methods, and targets to reduce the impact of plant protection products, combined with the need to maintain the quality and volume of agricultural production means that we must keep supplying farmers with effective protection solutions. Besides the direct advantages for the environment and farmers' finances, the careful rationalisation of treatments also fits in with the current pest situation. The past few years have indeed seen a steady increase in the number of fungus strains that are resistant to some fungicides.

Integrated protection, also called integrated control, provides a framework to work out and implement means of controlling harmful organisms. It takes into account all available methods of protecting plants. It also uses action levers that discourage the development

of harmful organism populations, and finds ways of limiting the size of resistant ones, such as rotation, cropping techniques, varietal resistance, seed and seedlings certified free from certain pests. It involves a balanced combination of fertilisation practices, and the protection and boosting of useful organisms. Plant protection products are only used as a last resort.

Practice analysis

The aim of the Smart-Pic project is to promote general use of this approach, by helping farmers to understand the decision making processes they need to implement, as well as by developing tools that meet those needs. To start with, it is focussing on bread wheat and vine. By proposing the same innovative approach to those two very different production sectors (see insert), the parties involved

are keen to encourage an exchange of ideas. Both crops will benefit from combined efforts to develop innovative data analysis and modelling methods.

With five million hectares and nearly 34 million tonnes of bread wheat, this crop accounts for over half of the French cereal harvest each year. Septoria, which is the most common and most harmful foliar disease, occupies centre stage in a farmer's fungicide programme. Typically, one to three treatments are factored in when plans are being made before the cropping season. Applications are then adjusted depending on the actual pressure from diseases during the season. The current imbalance between the benefits and the risks of carrying out an application vs not carrying it out means that, if in doubt, the farmer might decide himself, or on his advisor's recommendation, to treat. However, several trials have already shown that if the first treatment is correctly timed, and is based on information from decision support tools (DSTs), it reduces the need for fungicides in years with low risk factors, by reducing rates or even cutting out an application. One fewer fungicide application saves on average roughly €30/ha.



If the first treatment is properly timed, it can save an application in years with low pressure from septoria.

Understanding the complex nature of this approach

Farmers often prepare their plant protection programme before the start of the cropping season, without knowing what the weather conditions or the level of pressure from disease will be. And although there are also many effective decision support tools available in France, they usually focus on a single disease. It is also worth pointing out that there are many different sources of reference data and information on diseases affecting wheat and vine (plant health bulletins, forecasting models, technical brochures, etc.). Information is therefore fragmented and there is a lack of tools available to help understand the complexity of plant protection issues at field, cropping system and farm level. This shows that there is a need for new tools to help farmers make decisions adapted to their production objectives. The idea behind Smart-Pic is to integrate all this information and to link up the different steps of the process a farmer has to follow in order to reach a diagnosis and make a decision.

A farmer will save on average €30/ha by cutting out a badly timed treatment.

Producing innovative methods

Smart-Pic proposes to “dissect” the farmer's reasoning regarding crop protection, and to integrate a multi-disease approach as well as strategic and tactical elements into decision making. The project involves a statistical approach to develop indicators at different levels and on different scales. The individual level on the scale of a farm will help the decision-maker determine which tactical choices can or must be implemented to ensure his production is in synch with his strategic objectives. The collective level will secure the effectiveness of the strategic crop protection management carried out by technicians and advisors at regional monitoring network level. At the end of the project, tool prototypes will be put forward after a preliminary assessment in operational conditions. They will therefore already be partly integrated into the partner institutes' information systems.

You will find existing crop protection tools such as Septo-LIS, designed to work out the proper timing of the first treatment against septoria, or the disease barometer, on www.arvalis-infos.fr, under “Mes outils” (Tools).

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Multiple crops

The technical partners involved in the Smart-Pic project which started in January 2016 and will run over four years, make up the “Data modelling and analysis for agriculture” mixed technology network (www.modelia.org). They are: ACTA, the Network of animal and plant institutes, as leader; the Institut Français de la Vigne et du Vin (IFV, the French institute of vine and wine, and ARVALIS - Institut du végétal. They will be supported by scientific experts from various INRA and IRSTEA units. The project is funded by ACTA, IFV, ARVALIS and the French Department of Agriculture.